Space Weather Forecast

Issued on Monday 11 November 2024 at 13:13 Local

This forecast provides a four-day assessment of space weather events. The probabilities stated below are for reaching or exceeding the given levels. For more information about space weather impacts please see the Met Office Space Weather Scales https://www.metoffice.gov.uk/weather/learn-about/space-weather/uk-scales

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Space Weather Forecast Headline: Moderate solar activity is likely, with a slight chance of Strong class flares. Chance of G1/Minor Geomagnetic Storm intervals 13-14 Nov.

Analysis of Space Weather Activity over past 24 hours

Solar Activity: Solar activity was Moderate during the period, with four Moderate class flares from a large region in the southeast, the largest peaking at 10/1206 UTC. There are eight sunspot regions on the visible disc. The large region in the southeast is the largest and most complex region. It contains a number of mature spots with at least two delta regions, with continued growth in its leading portion. Another region in the southwest, has mature leading and trailing spots, but has seen some decay of its smaller spots occupying the intermediate region. The remaining spot regions are stable and magnetically simple.

No Earth-directed CMEs (Coronal Mass Ejections) were observed.

Solar Wind / Geomagnetic Activity: Solar winds were indicative of ongoing enhancement following likely coronal hole high speed stream influences. Wind speeds were slightly elevated throughout. The Interplanetary Magnetic Field was Moderate at first, before becoming generally Weak. The north-south component was mostly southward (negative) directed at Weak levels. A noticeable kick in the UK Magnetometers was observed around 10/1830 UTC, with Hartland showing a deflection of 118nT. This is possibly due to a localised substorm, perhaps in association with a weak transient feature or ongoing fast winds, with no evidence of increased geomagnetic activity at near-Earth satellites prior to this event.

Resultant Geomagnetic Activity was generally quiet to Active (Kp2-4), with a G2/Moderate Geomagnetic Storm (Kp6) interval at 10/1800-2100.

Energetic Particles / Solar Radiation: The count rate of energetic particles (high energy protons) was at background levels through the period.

Four-Day Space Weather Forecast Summary

Solar Activity: Moderate activity is forecast, with a likelihood of isolated Moderate class flares and a slight chance of Strong class flares, most probably from the complex sunspot in the east of the disk.

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Solar Wind / Geomagnetic Activity: No Earth-directed CMEs are currently forecast. Fast wind influences are expected through this period, initially from a coronal hole in the southwest of the disc and later from the large coronal hole to the north, currently moving into the western hemisphere. Current slightly elevated winds are expected to decline to background through Days 1-2 (11-12 Nov), before becoming elevated again with any connection to the next coronal hole fast wind through Days 3-4 (13-14 Nov).

Generally Quiet to Unsettled (Kp1-3) activity is forecast for Days 1-2 (11-12 Nov) as coronal hole influence eases, with a chance of Active (Kp4) intervals at first but this risk declining into Day 2. More Unsettled to Active (Kp3-4) conditions then expected through Days 3-4 (13-14 Nov) due to a HSS from CH90/+, with a slight chance of G1/Minor Geomagnetic Storm intervals (Kp5).

Energetic Particles / Solar Radiation: The count rate of energetic particles (High energy protons) is at background levels. There is a rising slight chance of S1/Minor Proton Storms should we see any significant flares.

Geomagnetic Storms

Geomagnetic Storm	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC)	Day 2 (00-24 UTC)	Day 3 (00-24 UTC)	Day 4 (00-24 UTC)
Probability (Exceedance)			(%)	(%)	(%)	(%)
Minor or Moderate	G1 to G2	Yes	20	10	30	30
Strong	G3	No	1	1	1	1
Severe	G4	No	1	1	1	1
Extreme	G5	No	1	1	1	1

Radio Blackouts - X-Ray Flares

X-Ray Flares	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC)	Day 2 (00-24 UTC)	Day 3 (00-24 UTC)	Day 4 (00-24 UTC)
Probability			(%)	(%)	(%)	(%)
Active	R1-R2 (M Class)	Yes	70	70	70	70
Very Active	R3-R5 (X Class)	No	20	20	20	20

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Solar Radiation Storms (High Energy Protons)

Radiation Storms Probability (Exceedance)	Level ($cm^{-2}sr^{-1}s^{-1}$)	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	**≥ S1**	No	15	15	15	20
Very Active	**≥ S3 ***	No	1	1	1	1
* S3 ≥ 10 MeV ≥ 1000 pfu and/or 50 MeV ≥ 10pfu. (pfu = $cm^{-2}sr^{-1}s^{-1}$)						

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